

near 29° to 30° N., 78° to 80° W., ships were reporting southeast winds of force 6 to 8. The highest wind reported by a vessel in east coast waters during the morning was of force 9 from the southeast, at 4.30 a. m., in 30° N., 80°15' W., barometer 29.79.

The following description of the history of the storm as it affected the coast and mainland of Florida, is quoted from the report of Mr. Grady Norton, forecaster on duty at Jacksonville:

The center of the storm passed inland on the east Florida coast moving in a northwesterly direction about 9 a. m. to 10 a. m. on August 30 in the vicinity of Ormond Beach, attended by gales of 50 to 60 miles per hour over a stretch of the coast extending roughly from New Smyrna to St. Augustine. The lowest pressure reported was 29.38 inches, by the Coast Guard at the northern end of Daytona Beach, though this location was probably not in the exact center and may not represent the lowest experienced.

No lives were lost on this stretch of coast, but considerable minor property damage occurred to communication lines and electric wires, and also to some buildings and other flimsy structures. A good many trees were blown down on wires and across highways, causing temporary delays in traffic.

Timely and accurate warnings doubtless resulted in considerable saving of property throughout the affected area. Small craft had been secured in safe places and low islands evacuated well in advance of the storm.

This storm was very small in diameter but rather intense for its

size, and was remarkably persistent after passing inland. Although it gradually lost intensity, it caused some damage to power lines at Lake City, Fla., more than 100 miles from where it entered land from the Atlantic, and heavy rains and squalls persisted on through the northwestern counties of Florida causing considerable damage by flooding and washing out of roads and bridges. A maximum wind velocity of 28 miles per hour was reported from Apalachicola just after the passage of the center some distance to the north of that place.

The S. S. *Tarpon* sank off Panama City, Fla., with loss of possibly 15 lives. Press reports indicate that heavy squalls attending the disturbance may have been the cause, but this had not been definitely established. * * * The disturbance preserved its identity on northwestward through Alabama, Mississippi, and Arkansas.

As the storm went inland, exceptionally high tides were reported northward along the upper Florida and the Georgia coasts. In Alabama, on September 1, heavy rains over the southern part of the State caused damage to crop and other property estimated in press reports as amounting to possibly millions of dollars.

The disturbance was well covered by advisories issued at San Juan on August 23 to 25, and later by those issued at Jacksonville. Northeast storm warnings were ordered at 7.30 p. m. (E. S. T.) of the 29th northward from Vero Beach to St. Augustine, Fla., and at 3 a. m. of the 30th, from St. Augustine to Savannah.

NOTES AND REVIEWS

B. HAURWITZ. *The Physical State of the Upper Atmosphere*. Rep. from *Jour. Roy. Astron. Soc. Can.*, 1936 Oct.-1937 Feb. University of Toronto Press, 1937.

H. R. MIMNO. *The Physics of the Ionosphere*. *Reviews of Modern Physics*, vol. 9, pp. 1-43, 1937 Jan.

The phenomena and physical conditions in the extreme upper atmosphere have in recent years come to be of increasing interest to meteorologists; and at the present time, active investigations are in progress to determine the possible influence of some of these phenomena on meteorological conditions in the lower atmosphere. The literature of the subject is extensive and rapidly growing.

The series of articles by Haurwitz is a general summary of present knowledge of the outer atmosphere, with 121

bibliographic references. Among the topics discussed are optical phenomena of the high atmosphere, nacreous and noctilucent clouds, meteor phenomena, the light from the night sky, ionization in the upper atmosphere and its role in the propagation of electromagnetic waves and in the diurnal variations of terrestrial magnetism, the aurora, atmospheric ozone, anomalous propagation of sound in the atmosphere, and the chemical composition of the air at high levels.

The paper by Mimno is a technical discussion of observational facts and physical theories relating to the propagation of radio waves and the state of the ionized regions, and their relations to other geophysical phenomena, with over 300 references to the literature.—*Edgar W. Woolard*.

BIBLIOGRAPHY

[RICHMOND T. ZOCH, in charge of Library]

By AMY D. PUTNAM

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Ackeret, J.

High-speed wind tunnels. Washington. November 1936. 22 p. figs., diags. 26½ cm. (U. S. National advisory committee for aeronautics. Technical memorandum. No. 808.)

The blizzard men of 1888. An account of the annual meeting and luncheon of March 12, 1936, New York City, and some historical references. Newark, N. J. 1937. [12] p. 23 cm.

Ertel, Hans.

Zusammenhang von Luftdruckänderungen und Singularitäten des Impulsdichtefeldes. Berlin. 1936. 12 p. figs. 26 cm. [Sonderausgabe aus den Sitzungsberichten der Preuss. Akademie der Wissenschaften, Phys.-Math. Klasse, 1936. XX.]

Great Britain. Meteorological office.

Averages of bright sunshine for the British Isles for periods ending 1935. London. 1936. 43 p. tables. 24½ cm. (M. O. 408.)

Hannay, Mrs. Annie Murray, comp.

The influence of weather on crops; 1900-1930; a selected and annotated bibliography. Wash., D. C. 1931. 246 p. 23½ cm. (U. S. Dept. of agric. Miscell. pubn. no. 118.) Contribution from Bureau of agricultural economics.

Hoover, William H.

The dependence of carbon dioxide assimilation in a higher plant on wave length of radiation. Wash., D. C. 1937. 13 p. pls., diags. 24½ cm. (Smithsonian miscellaneous collections. v. 95, no. 21.) Publication 3406.

International commission for synoptic weather information.

Report of the tenth meeting, Warsaw, Sept. 5, 6, & 10, 1935, and of the joint meetings with the Climatology commission at Warsaw, Sept. 6 and 10, 1935. Leyde. 1936. 144 p. figs., tables. 24½ cm. (no. 31.)

International meteorological organization.

Conférence des directeurs à Varsovie 6-13 septembre 1935.
Tome II. Appendices aux Procès-verbaux. Leyde. 1937.
215 p. illus., fold. map, tables (part fold.) 24 cm. (no. 29.)

— Secretariat.

1. Comptabilité de l'année financière 1935-1936. II. Rapport sur les travaux du Secrétariat pendant l'année 1935-1936. [DeBilt.] 1936. 13 p. tables. 24½ cm.

Palmén, E.

Registrierballonaufstiege in einer tiefen Zyklone. Helsingfors. 1935. 32 p. figs., tables, diagrs. 24 cm. (Mitteilungen des Meteorologischen Instituts der Universität. Helsingfors. No: 26.)

Pardé, Maurice.

Les cours d'eau les mieux alimentés du monde. Pithiviers. [n. d.] 14 p. 24½ cm.

Recherches sur les gros débits des cours d'eau. Pithiviers. [n. d.] 15 p. 24½ cm.

Rôle de la neige dans le régime du Drac au Sautet. Pithiviers. [n. d.] 14 p. 25 cm.

Philp, Charles G.

The conquest of the stratosphere. London. 1937. ix, 205 p. illus. (map, chart). 19 cm.

Simpson, George, & Scrase, F. J.

The distribution of electricity in thunderclouds. Lond. 1937. p. 309-352. figs., plates, tables, diagrs. 25½ cm. [Reprinted from "Proceedings of the Royal Society of London", Series A. No. 906, vol. 161, p. 309-352, August 1937.]

Thorntwaite, C. Warren.

The life history of rainstorms. New York. 1937. p. 92-111. fold. map, figs., tabs., diagrs. 25½ cm. (Reprinted from Geographical review, v. XXVII, no. 1, Jan., 1937.)

Walters, Rupert Cavendish Skyring.

The nation's water supply. Lond. 1936. xv, 244 p. plates (part col.), maps (part fold.), diagrs. 23½ cm.

SOLAR OBSERVATIONS

SOLAR RADIATION OBSERVATIONS DURING
AUGUST 1937

By IRVING F. HAND, Assistant in Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January 1935 REVIEW, page 24.

Table 1 shows that solar radiation intensities averaged below normal for August at Washington and Madison, and close to normal at Lincoln.

Table 2 shows an excess in the amount of total solar and sky radiation received on a horizontal surface at all stations with the exception of Washington, Miami, New Orleans, Blue Hill and Friday Harbor—all enumerated stations being comparatively close to the Coasts.

TABLE 1.—Solar radiation intensities during August 1937

[Gram-calories per minute per square centimeter of normal surface]

WASHINGTON, D. C.

Date	Sun's zenith distance										Local mean solar time	
	8 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		Noon
	75th mer. time	Air mass										
		A. M.				1 1.0	P. M.					
		e	5.0	4.0	3.0		2.0	2.0	3.0	4.0		5.0
Aug. 2	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	
Aug. 3	16.79		0.36	0.42	0.62	cal.	cal.	cal.	cal.	cal.	13.13	
Aug. 4	15.65			.83	.97	1.26					14.10	
Aug. 5	16.20	0.42	.51	.59	.86						14.10	
Aug. 16	18.59				.76						17.37	
Aug. 17	14.60		.76	.91	1.12						11.81	
Aug. 19	14.10			.71	.95						14.60	
Aug. 20	19.89		.42	.60	.86						19.89	
Aug. 21	18.59			.56	.78	1.23					19.89	
Aug. 21	19.89				.87						20.57	
Means		(.42)	.51	.66	.87	1.24						
Departures		-.21	-.17	-.10	-.07	-.01						

¹ Extrapolated.

Polarization measurements made at Madison on 9 days give a mean of 52 percent with a maximum of 62 percent on the 4th. Both of these values are slightly below the corresponding August normals.

TABLE 1.—Solar radiation intensities during August 1937—Contd.

[Gram-calories per minute per square centimeter of normal surface]

MADISON, WIS.

Date	Sun's zenith distance										Local mean solar time	
	8 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		
	75th mer. time	Air mass										
		A. M.					1.0	P. M.				
		e	5.0	4.0	3.0	2.0		2.0	3.0	4.0		5.0
	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	
Aug. 4	14.60			1.04	1.22	1.42					17.96	
Aug. 5	10.21			.97	1.13	1.36					9.47	
Aug. 6	13.13					1.34					10.97	
Aug. 7	14.10		.68	.80	1.08						13.13	
Aug. 9	16.79				.98	1.32					17.37	
Aug. 12	10.21						1.08				15.65	
Aug. 13	11.38			.96	1.12	1.28					12.24	
Aug. 14	11.81			.82	1.00	1.39					12.24	
Aug. 23	11.38			.67		1.30					10.97	
Aug. 24	12.68					1.34					13.13	
Aug. 25	13.13			.70	.85						13.13	
Aug. 27	16.20		.67	.86							15.65	
Aug. 30	15.11		.56	.65	.88						14.10	
Means			.64	.83	1.03	1.33	(1.08)					
Departures			-.16	-.10	-.06	+0.01	+0.03					

LINCOLN, NEBR.

Aug. 4	18.59	.64	.73	.86	1.10	1.38					16.20
Aug. 5	16.79	.65	.76	.93	1.10						11.81
Aug. 6	12.68	.60	.69	.86	1.06	1.40					13.13
Aug. 9	19.89	.58	.72	.86	1.08	1.37					19.23
Aug. 12	11.81	.80	.87	.95	1.24	1.47					9.83
Aug. 14	11.81	.72	.84	1.00	1.19	1.40					14.10
Aug. 16	15.65	.68	.80	.95	1.16	1.38					13.13
Aug. 20	16.79						1.17	0.99	0.79	0.68	13.61
Aug. 21	11.38	.84	.93	1.07	1.27	1.49					10.59
Aug. 27	15.65		.76	.91	1.16	1.43					15.11
Aug. 28	15.65	.63	.76	.89	1.12	1.35					12.24
Aug. 31	12.68		.72	.88	1.15	1.34					11.38
Means		.68	.78	.93	1.15	1.40	(1.17)	(0.99)	(0.79)	(0.68)	
Departures		.00	.00	+0.02	+0.06	+0.08	+0.10	+0.10	+0.04	+0.03	